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SEASONAL FLIGHT PATTERNS OF HEMIPTERA IN A NORTH CAROLINA BLACK WALNUT PLANTATION. 4. CIMICOIDEA

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ABSTRACT

The seasonal flight patterns of 12 species of Cimicoidea collected in window traps in a North Carolina black walnut plantation are described. Flying height distributions and seasonal flight activities of *Nabis americoferus, N. roseipennis* and *Orius insidiosus* are considered in detail.

This is the fourth in a series of papers on seasonal flight patterns of Hemiptera in a black walnut (*Juglans nigra* L.) plantation near Asheville, North Carolina, and deals with the superfamily Cimicoidea; earlier papers dealt with the Pentatomoidea (McPherson and Weber 1980), Coreoidea (McPherson and Weber 1981a) and Reduvioidea (McPherson and Weber 1981b). The study was conducted from 24 March to 14 October 1977, and from 24 March to 13 October 1978. Specimens were collected weekly by window trapping; traps were suspended at 1, 2, 3, 4, 5, 6 and 7 m. The study site and trap construction were discussed in detail by McPherson and Weber (1980). All hemipteran specimens collected during this study were deposited in the Entomology Collection, Zoology Research Museum, Southern Illinois University, Carbondale.

RESULTS AND DISCUSSION

Twelve cimicoid species were collected during the two years of this study including six nabids and six anthocorids; numbers of specimens for these species ranged from 1 to 5187 (Table 1).

Most taxa were collected in numbers too low to permit conclusions about seasonal flight patterns. However, *Nabis americoferus, N. roseipennis* and *Orius insidiosus* were collected in sufficient numbers (Table 1) to permit a more detailed discussion of flying height distributions and seasonal flight activities.

N. americoferus occurs on grasses and weeds (Blatchley 1926) and feeds on aphids, leafhoppers, and caterpillars (Harris 1928). It overwinters as adults (Harris 1928). Stoner et al. (1975) felt that it probably has five generations per year in Arizona.

N. roseipennis usually occurs in tall grasses and weeds but can be found in dense upland woods (Blatchley 1926); it feeds on insects inhabiting grassy and herbaceous vegetation (Blatchley 1926). It overwinters as adults, and is apparently univoltine, in the Cranberry Lake region of New York (Mundinger 1922).

In the present study, *N. americoferus* adults were found from late March to mid-October and *N. roseipennis*, from early April to early October (Table 1). Both species were collected

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Table 1. Seasonal flight activity of Cimicoidea during 1977–78 in a North Carolina black walnut plantation.

Taxon	No. Collected	Collection Height (m) $\bar{x}\pm SE$	Collection Height (m) Range	Range of Collection Dates
NABIDAE				
Hoplistoscelis sordidus (Reuter)	1	4.00	—	7 April
Lasiomerus annulatus (Reuter)	1	7.00	—	22 July
Nabis americoferus Carayon	58	2.48±0.24	1–7	31 March–13 Oct.
Nabis capsiformis Germar	14	4.29±0.61	1–7	7 July–29 Sept.
Nabis roseipennis Reuter	123	3.07±0.16	1–7	1 April–6 Oct.
Pagasa fusca (Stein)	2	2.00±1.00	1–3	22 July–4 Aug.
ANTHOCORIDAE				
Anthocoris sp.	2	4.00±3.00	1–7	6 May–29 Sept.
Calliodis temnostethoides (Reuter)	21	5.24±0.21	3–6	10 June–6 Oct.
Lasiochilus fusculus (Reuter)	2	5.50±1.50	4–7	25 Aug.–8 Sept.
Lyctocoris campestris (Fabricius)	1	7.00	—	18 Aug.
Lyctocoris stalii (Reuter)	1	6.00	—	30 June
Orius insidiosus (Say)	5,187	3.45±0.74	1–7	31 March–13 Oct.

at all seven flying heights (Figs. 1–2); however, a comparison of the flying height distributions of these species with the χ^2 test for two independent samples showed that there was a significant difference at the 0.01 level (i.e., most adults of *A. americoferus* flew at a lower height than those of *A. roseipennis*).[3]

Both nabid species apparently overwintered as adults and were bivoltine. Overwintered adults began to emerge during late March to early April and gave rise to a summer generation which was present from about June through August and peaked in early to mid-July (Figs. 4–5). This generation gave rise to the overwintering generation which was present from September to October. Additional generations may be indicated by the smaller peaks during the season (e.g., early to mid-August) but these peaks are of such short duration that they probably resulted from random variation or were a response to some environmental factor (e.g., temperature).

O. insidiosus is a common species which feeds on both insects and plants (e.g., Barber 1936, Dicke and Jarvis 1962, Marshall 1930) and is often found on corn (e.g., Barber 1936, Dicke and Jarvis 1962, Garman and Jewett 1914, Phillips and Barber 1933). Barber (1936) studied its seasonal abundance on corn in Virginia where it occurred from the third or fourth week in June to as late as early November and reached maximum populations during the first or second week in August. He felt that it usually has two or three generations per year on this plant. Marshall (1930) stated that, in Kansas, it overwinters only as adults.

In the present study, *O. insidiosus* adults were found from late March to mid-October (Table 1). They flew at all seven heights but were most frequently collected at 1–3 m (Fig. 3).

This species apparently overwintered as adults and was bivoltine (Fig. 6). Overwintered adults began to emerge in late March and apparently gave rise to a summer generation that was present from about mid-June to late August and peaked in late June to early July; the month difference between this peak and that reported by Barber (1936) may simply reflect the more southern location of the present study. This generation gave rise to the overwintering generation that was present from September to October.

[3]Data were grouped in the following categories for testing: 1–2, 3–4 and 5–7 m; $\chi^2 = 10.78$.

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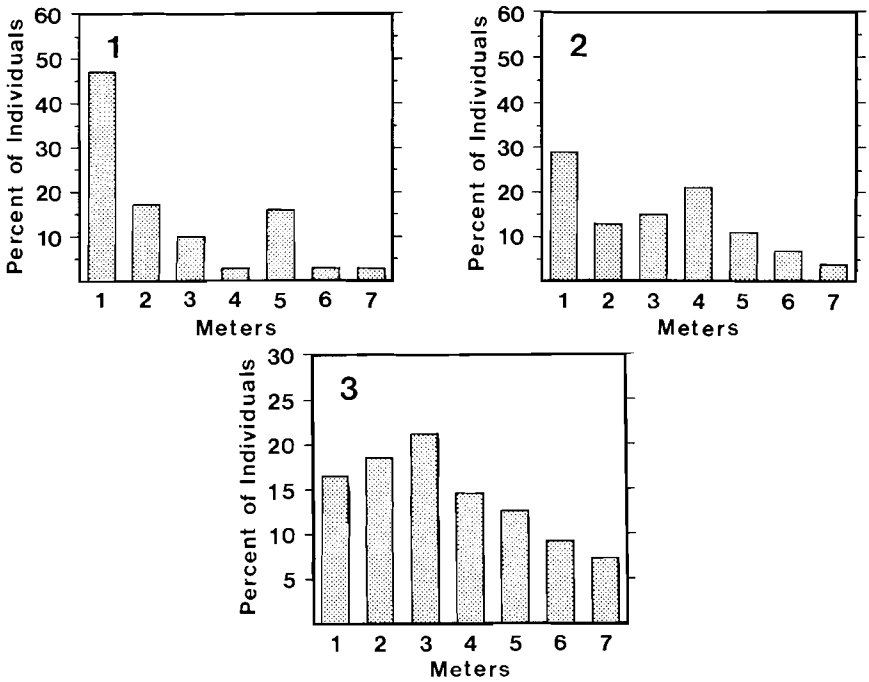
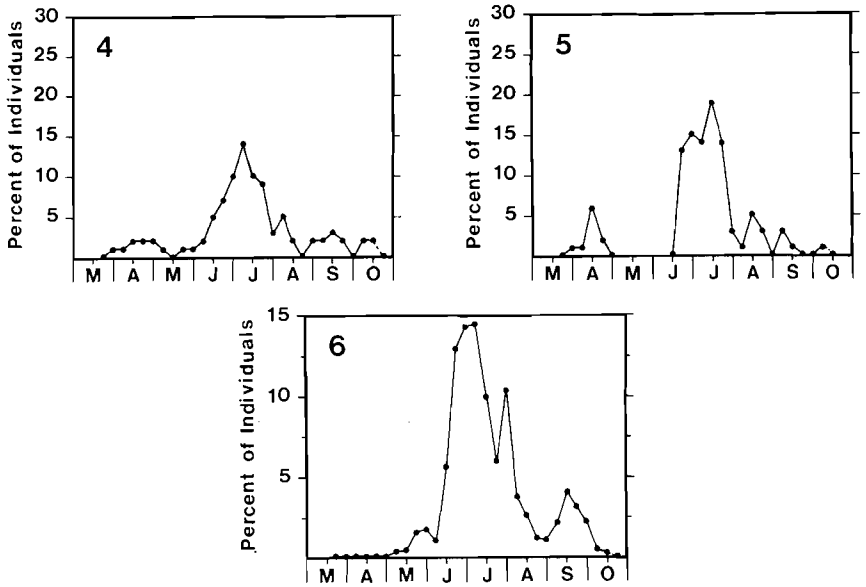


Figs. 1–3. Flying height distributions of three cimicoid species during 1977–78 in a North Carolina black walnut plantation: (1) *Nabis americoferus*, (2) *N. roseipennis*, (3) *Orius insidiosus*.



Figs. 4–6. Seasonal flight activities of three cimicoid species during 1977–78 in a North Carolina black walnut plantation: (4) *Nabis americoferus*, (5) *N. roseipennis*, (6) *Orius insidiosus*.

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